



INTERNATIONAL SOCIETY FOR STRUCTURAL HEALTH MONITORING OF INTELLIGENT INFRASTRUCTURE

October 2011 ISHMII Membership Notes

President's Letter



Dear Colleagues,

In December, we will gather in Cancun, Mexico for the [SHMII-5 Conference](#). I invite you to join us at SHMII-5.

We are pleased to report on advances in the use of sensors and monitoring that provide data critical to and enhance the means by which we understand and respond to the health of civil and heritage structures. In November, our e-newsmagazine *The Monitor* will carry reports that illustrate the accomplishments of ISHMII members working in the field of sensor development and structural health monitoring of intelligent infrastructure in India, South Korea, the USA and elsewhere.

Let us know about your experiences.



Many of the examples from which we learn are those with the potential for great danger and cost. The September 9, 2011 emergency closure of the nearly 50-year-old Sherman Minton Bridge presents a strong argument for retrofitting advanced monitoring systems to



INTERNATIONAL CONFERENCE ON
STRUCTURAL HEALTH MONITORING OF
INTELLIGENT INFRASTRUCTURE
Cancun, Mexico 2011

FINAL ANNOUNCEMENT

SHMII-5 Conference Cancun, Mexico December 11-15, 2011

**Register today for the 5th
International Conference on
Structural Health Monitoring of
Intelligent Infrastructure**

SHMII-5 will provide a unique opportunity for scientists, practitioners and enterprises from around the world and from a broad range of disciplines to share and discuss the latest knowledge and SHM technologies. Sessions will address smart sensors, wireless sensor networks, signal acquisition and processing, and real-time data transferring and management, as well as many more topics.

With a Click You Can

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older bridges.



Sherman Minton Bridge between New Albany, Indiana and Louisville, Kentucky USA

Structural engineers became concerned about a 2.5-inch crack in a T-1 steel support beam below the lower deck in the Sherman Minton Bridge, a 6-lane double-deck through arch bridge. This crack was exposed when a connection plate was removed during a repair job. The beam is a critical load-carrying element and T-1 steel, frequently used in the 1950s and 1960s, is susceptible to cracking. Cracks in the tension ties of both spans, that re-enforce the bridge, were also being observed and repaired. Cracks had been identified during inspections as early as 2004.



Indiana Department of Transportation inspection reports document problems and repairs

The T-1 steel is not necessarily the cause of the cracks. The fault may rest with a combination of factors that also includes the bridge design and construction.

The Sherman Minton Bridge is fracture critical, which according to [American Association of State Highway and Transportation Officials \(AASHTO\) Guide Specifications](#) pertains to

Learn About the Short Course on SHM

Meet the Key Note Speakers

Six Keynote Lectures will be presented during SHMII-5 capturing the breadth of member's interests and directions in the field.



Carmen Andrade, Research Professor of the National Research Council of Spain at the Institute of Construction Science "Eduardo Torroja" will speak on the *Interpretation of Corrosion Monitoring from Embedded Sensors*. **Daniele Inaudi**, Chief Technology Officer, the RocTest Group, will address the *Cost-Benefits Analysis in SHM Projects*.



Katerina Krebber, BAM Federal Institute for Materials Research and Testing, Berlin, will discuss *Structural Health Monitoring by Smart Technical Textiles based on Fiber Optic Sensors*. In keeping with the venue of SHMII-5, **Roberto Meli**, Emeritus Professor at the Instituto de Ingeniería, UNAM, will present on *Research and Practice on Structural Health Evaluation of Ancient Stone Masonry Buildings in Mexico*.



David Potter, Principal Market Development Manager for Structural and Physical Test with National Instruments will present a talk *Out of the Lab, into the Field: Integrating Modern SHM Systems on Real-World Structures*. **Hwayaw Tam**, Director of Photonics Research Centre, Department of Electrical Engineering, The Hong Kong Polytechnic University, will conclude with a presentation on *The Amazing Versatility of Fibre Bragg Grating Sensors for Infrastructure Monitoring*.

“Members that are tension members or tension components of members whose failure would be expected to result in collapse of the bridge.” Moreover, there must not be any other member or system of members which will serve the functions of the member in question should it fail.

While the Sherman Minton Bridge is functionally obsolete, it was not declared structurally deficient in its 2009 bi-annual inspection. According to the [National Bridge Inspection Standards](#), a functionally obsolete bridge is one that was built to standards that are no longer contemporary. It may have inadequate lane or shoulder widths or vertical clearances or it may flood occasionally. While neither a functionally obsolete bridge nor a structurally deficient bridge is inherently unsafe, one that is structurally deficient carries other concerns. Most of these require maintenance, repairs, rehabilitation or replacement to correct the deficiencies. It can remain open, unless unsafe conditions are identified, usually during a routine inspection, when it must be closed.



[Plan to Explore Cancun](#)

[Book A Hotel Room at the Venue](#)

The conference will be held at the Ritz-Carlton, Cancun.



CSHM-4 Workshop

Integrity of SHM Systems for Deficient Structures

November 6-8, 2012 - Berlin, Germany

The 2012 Civil Structural Health Monitoring Workshop (CSHM-4) will be held at the [Bundesanstalt für Materialforschung und-prüfung](#) (BAM), the Federal Institute for Materials Research and Testing.

Details will be announced in December 2011. For additional information contact

[Wolfgang R. Habel, Ph.D.](#)

We Are ISHMII

The *International Society for Structural Health Monitoring of Intelligent Infrastructure* (ISHMII) is a professional society comprised of practitioners, infrastructure owners and managers,



Inspections followed the bridge closure

This bridge crosses the Ohio River linking southern Indiana with urban, commercially significant Louisville, Kentucky. When the bridge was closed during rush hour, it was a sure sign of the immediacy of the problem. Close to 80,000 vehicles a day are now redirected onto two smaller bridges, already heavily used but safe structures. For regional planners, this was a wake-up call as these bridges are important to interstate and cross-river commerce. Overweight and over-dimension carriers, prohibited on the local bridges, present another planning problem, but together authorities in the States of Indiana and Kentucky have responded well to these situations.

Public concern runs deep, as does an appreciation that the risk was discovered without a disaster. In fact, when the [Indiana Department of Transportation](#) (INDOT) began its examination, the combination of the cracks and bridge weight was sufficient for them to restrict the number of contractors on the bridge. The Federal Highway Administration called for similar bridges to be inspected.

government agencies, associations, academics, and students.



Members seek to enhance the long-term stability and reliability of public works structures and prolong their service through monitoring processes.

Our Web site contains information that advances and shares our knowledge of structural health monitoring.

The [*ISHMII Knowledge & Education Center*](#) contains pages of interest including Thesis' & Dissertations, Case Studies, Proceedings & Literature, and Education & References.



We publish the [*Journal of Civil Structural Health Monitoring*](#). Submit your paper to the [JCSHM Editorial Manager](#).

Twice a year, we publish [*The Monitor*](#), an e-Newsletter covering important CSHM topics from contributors around the world, book reviews and introductions to case studies and research. Expect the next issue in November 2011.

Read the [July 2011 issue of *The Monitor*](#).

Contributions for the November 2011 *The Monitor*, photos and material for the ISHMII Web site should be sent to Nancy Cohen at NancyC@ishmii.org.



This story has a promising ending, one that places safety first and will give the Sherman Minton Bridge an additional 20 years of useful life.

Following three weeks of inspection, testing and analysis, the Indiana and Kentucky have agreed that the bridge will be repaired over the next six months at a cost of about \$20M. It is an aggressive plan. Inspection confirmed that closing the bridge was the correct decision as defects were found at 40 percent of the weld sites. Tests dated the 2.5 inch crack to 1962, the year the bridge opened. Five to seven old cracks were also found when plates were removed.

According to the INDOT, which has the lead responsibility for the maintenance of the bridge, modern steel plating will be bolted on both sides of the horizontal bridge tie along the 1,600-foot (488 m) structure. This will increase its safety and reliability.



[Repair animation](#)

ISHMII members outside the USA might be interested in the fact that there is a critical policy discussion about our aging infrastructure within the government. President Barak Obama has mentioned the Sherman Minton Bridge as an example during the debate about funding sources, project criteria and the jobs that a bridge and road repair and replacement program could add to the workforce if new Federal spending is appropriated.

Visit our Web site for information about upcoming [conferences and workshops](#).

Find us at ISHMII.org

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Professional advertisements may be placed on the **ISHMII.org Web site** and in our e-publications, **The Monitor** and **Membership Notes**.



ISHMII.org Web site: Your logo and contact information with an active URL are posted on our **Professional Partners** page.



The Monitor: Your logo, contact information with an active URL and up to 4 lines of text descriptive of your product or services (approximately 25 words) are included in this bi-annual e-news magazine.



Membership Notes: Your logo and contact information with an active URL are included in the President's e-newsletter.

Rates in USD

ISHMII.org Professional

Partners: \$400.00/6 months and \$600.00/one year.

The Monitor: \$400.00/one issue and \$700.00/two consecutive issues.

Membership Notes: \$250.00/two consecutive issues and \$325.00/3 consecutive issues.

Continuing sponsorship rates or combination rates are available at a discount.

For additional information, please communicate with Nancy Cohen



President Barack Obama speaks on spending for infrastructure at Brent Spence Bridge in Ohio

In ISHMII, we share a vision in which managers of civil structures achieve safety and economic goals through the continual use of monitoring tools, real-time data collection and data-driven planning. Most evolving but not yet critical problems bear watching closely while a response is planned. This example suggests that with sensors in place as a cautionary and diagnostic measure, cracks could have been measured in real-time and changes tracked between the mandated inspections. Data might have allowed engineers to begin preparations for critical repairs much earlier.

From a safety and logistics perspective, sharing critical data on bridge health also informs planners about potential transportation demands on the regional system of roads, bridges and public transportation.

The life of a bridge can be extended considerably, with financial surety, when managers and engineers know the health of their structure, but the economic reality of keeping older civil structures functional rests with policy-makers. We should remind our industry partners that one of the greatest public problems is the decision not to channel resources into repairs when a problem is discovered because planning in the face of a disaster is more difficult.

Sincerely,

Farhad Ansari
President

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Managing Editor, *The Monitor*.

Rates may be adjusted, as needed.

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and New Memberships are Now
Available.***

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corporate or student member and
share our mission of building
knowledge about Structural Health
Monitoring.**

**Individual membership is \$100
Corporate membership is \$250 for
four individuals
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with verification of student status**

[Renew Your Membership](#)

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***We acknowledge these sites for their
photographs and information.***

Sherman Minton Bridge: Photo courtesy of State of Indiana Department of Transportation (INDOT).

Pre-2011 INDOT inspection reports with photos and 2011 media reports on the Sherman Minton Bridge are available at
www.in.gov/indot/projects/2363.htm

Inspections: Photos courtesy of WLKY.com and WDRB.com

Repair animation: Courtesy of Courier-Journal.com

President Barak Obama: Photo by Pablo Martinez Monsivais/Getty Images



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